

Logarithmic functions are inverses of exponential functions

$$\begin{aligned}
 10^4 &= 10000 & \text{so} & \log_{10}(10000) = 4 \\
 10^3 &= 1000 & \text{so} & \log_{10}(1000) = 3 \\
 10^2 &= 100 & \text{so} & \log_{10}(100) = 2 \\
 10^1 &= 10 & \text{so} & \log_{10}(10) = 1 \\
 10^0 &= 1 & \text{so} & \log_{10}(1) = 0 \\
 10^{-1} &= 0.1 & \text{so} & \log_{10}(0.1) = -1 \\
 10^{-2} &= 0.01 & \text{so} & \log_{10}(0.01) = -2 \\
 10^{-3} &= 0.001 & \text{so} & \log_{10}(0.001) = -3 \\
 10^{-4} &= 0.0001 & \text{so} & \log_{10}(0.0001) = -4
 \end{aligned}$$

$$\begin{aligned}
 3^5 &= 243 & \text{so} & \log_3(243) = 5 \\
 3^4 &= 81 & \text{so} & \log_3(81) = 4 \\
 3^3 &= 27 & \text{so} & \log_3(27) = 3 \\
 3^2 &= 9 & \text{so} & \log_3(9) = 2 \\
 3^1 &= 3 & \text{so} & \log_3(3) = 1 \\
 3^0 &= 1 & \text{so} & \log_3(1) = 0
 \end{aligned}$$

$$3^{-1} = \frac{1}{3} \quad \text{so} \quad \log_3\left(\frac{1}{3}\right) = -1$$

$$3^{-2} = \frac{1}{9} \quad \text{so} \quad \log_3\left(\frac{1}{9}\right) = -2$$

$$3^{-3} = \frac{1}{27} \quad \text{so} \quad \log_3\left(\frac{1}{27}\right) = -3$$

$$3^{-4} = \frac{1}{81} \quad \text{so} \quad \log_3\left(\frac{1}{81}\right) = -4$$

$$3^{-5} = \frac{1}{243} \quad \text{so} \quad \log_3\left(\frac{1}{243}\right) = -5$$

$$\begin{aligned}
 5^4 &= 625 & \text{so} & \log_5(625) = 4 \\
 5^3 &= 125 & \text{so} & \log_5(125) = 3 \\
 5^2 &= 25 & \text{so} & \log_5(25) = 2 \\
 5^1 &= 5 & \text{so} & \log_5(5) = 1 \\
 5^0 &= 1 & \text{so} & \log_5(1) = 0 \\
 5^{-1} &= \frac{1}{5} & \text{so} & \log_5\left(\frac{1}{5}\right) = -1
 \end{aligned}$$

$$5^{-2} = \frac{1}{25} \quad \text{so} \quad \log_5\left(\frac{1}{25}\right) = -2$$

$$5^{-3} = \frac{1}{125} \quad \text{so} \quad \log_5\left(\frac{1}{125}\right) = -3$$

$$5^{-4} = \frac{1}{625} \quad \text{so} \quad \log_5\left(\frac{1}{625}\right) = -4$$

$2^{10} = 1024$	so	$\log_2(1024) = 10$
$2^9 = 512$	so	$\log_2(512) = 9$
$2^8 = 256$	so	$\log_2(256) = 8$
$2^7 = 128$	so	$\log_2(128) = 7$
$2^6 = 64$	so	$\log_2(64) = 6$
$2^5 = 32$	so	$\log_2(32) = 5$
$2^4 = 16$	so	$\log_2(16) = 4$
$2^3 = 8$	so	$\log_2(8) = 3$
$2^2 = 4$	so	$\log_2(4) = 2$
$2^1 = 2$	so	$\log_2(2) = 1$
$2^0 = 1$	so	$\log_2(1) = 0$

$2^{-1} = \frac{1}{2}$	so	$\log_2\left(\frac{1}{2}\right) = -1$
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$2^{-2} = \frac{1}{4}$	so	$\log_2\left(\frac{1}{4}\right) = -2$
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$2^{-3} = \frac{1}{8}$	so	$\log_2\left(\frac{1}{8}\right) = -3$
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$2^{-4} = \frac{1}{16}$	so	$\log_2\left(\frac{1}{16}\right) = -4$
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$2^{-5} = \frac{1}{32}$	so	$\log_2\left(\frac{1}{32}\right) = -5$
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$2^{-6} = \frac{1}{64}$	so	$\log_2\left(\frac{1}{64}\right) = -6$
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$2^{-7} = \frac{1}{128}$	so	$\log_2\left(\frac{1}{128}\right) = -7$
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$2^{-8} = \frac{1}{256}$	so	$\log_2\left(\frac{1}{256}\right) = -8$
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$2^{-9} = \frac{1}{512}$	so	$\log_2\left(\frac{1}{512}\right) = -9$
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$2^{-10} = \frac{1}{1024}$	so	$\log_2\left(\frac{1}{1024}\right) = -10$
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